

January 8, 1997
NARRATIVE FOR
PENNINGTON COUNTY, SOUTH DAKOTA
OIL & GAS DEVELOPMENT POTENTIAL MAP

INTRODUCTION

Pennington County lies west of the Missouri River in South Dakota. The topography in this county ranges from the mountainous terrain of the Black Hills in the west, with the rolling plains near the center of the county, to the dissected badlands in the eastern portion of the county. The arid climate in the eastern part of the county has been responsible for a number of deep water wells which provides a number of data points on the thickness of sedimentary section. Currently, there are no producing oil and gas wells in this county.

OCCURRENCE POTENTIAL

Oil & gas occurrence potential in Pennington County ranges from high to very low. Regional geologic mapping (Mallory, 1972, p. 56) indicates the northeastern part of the county contains more than 5000 feet of sedimentary rocks (Mallory, 1972). This is the same package of rocks which contain source beds and producing reservoirs in the adjacent Williston Basin.

The rest of the eastern half of Pennington County contains between 2000-5000 feet of sedimentary rock, the same, but thinner package of source and reservoir rocks. The Wheless 10-8 Federal well (T. 4 S., R. 16E., Sec. 10) encountered 4593 feet of sedimentary rock before drilling into Precambrian granite.

The west half of Pennington County outside of the Black Hills uplift contains less than 2000 feet of sedimentary rocks for low occurrence potential. These rocks are thinner because they are draping off the Black Hills Uplift. The Black Hills Uplift portion of the county contains only crystalline rocks and are therefore classified as very low occurrence potential.

DISCUSSION OF RATINGS

The only area of high development potential in Pennington County is in T. 2 N., R. 17 E., Black Hills Meridian (BHM). There have been three oil & gas tests drilled in this township, all in the past 15 years. All three tests reported oil shows in the Pennsylvanian Minnelusa Formation. The Minnelusa (locally known as the Leo sand) is a major oil and gas producing formation in neighboring Custer and Fall River Counties to the south. Because wildcat exploration plays typically center around areas where there have been reports of shows, this township can expect a high amount of development activity over the next fifteen years, relative to the rest of the county. Based on this analysis, three to four additional wells could be drilled in this township, with one to two producers in the next fifteen years.

The major portion of Pennington County is rated moderate development potential. As can be seen on the development potential map, the axis of the Williston Basin runs through this part of the county. Oil & gas tests down to the Precambrian crystalline basement here indicate this part of the county is covered with 5000+ feet of sedimentary rocks. This is the same package of rocks which contain source beds and reservoirs in other parts of the Williston Basin. Wildcatting and some very limited development may occur in this area in the next 15 years.

The oil & gas development potential decreases as one gets closer to the Black Hills uplift. Development activity is anticipated to be low (green color) along the rim of the Black Hills uplift. This is due to the thin sedimentary cover in these townships, and the lack of data from oil & gas drilling in this area. Widely-spaced wildcatting may occur in this area in the next 15 years.

The central core of the Black Hills is considered very low development potential (yellow color) because of the crystalline rocks exposed at the surface, lack of sedimentary rocks at the surface, and lack of oil & gas tests in this area. No oil and gas wells are anticipated in this area in the next 15 years.

REFERENCES CITED

Mallory, W.W.(ed.), 1972, Geologic atlas of the Rocky Mountain Region: Rocky Mountain Association of Geologists, p. 56.